

SEQUENCE LISTING

<110> Chiron Corporation
Pizza, Mariagrazia

<120> Polypeptide-Vaccines for Broad
Protection Against Hypervirulent Meningococcal Lineages

<130> 22300-21003.00

<140> 10/530,753

<141> 2003-10-02

<150> WO PCT/IB03/04848

<151> 2003-10-02

<150> GB 0309115.4

<151> 2003-04-22

<150> GB 0305831.0

<151> 2003-03-13

<150> GB 0223741.0

<151> 2002-10-11

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<212> PRT

<213> N. meningitidis

<400> 1

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Ala Ala Thr Val Ala Ile Ala Ala Tyr Asn Asn Gly Gln Glu Ile
 35             40             45
Asn Gly Phe Lys Ala Gly Glu Thr Ile Tyr Asp Ile Asp Glu Asp Gly
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Thr Ile Thr Lys Lys Asp Ala Thr Ala Ala Asp Val Glu Ala Asp Asp
 65             70             75             80
Phe Lys Gly Leu Gly Leu Lys Lys Val Val Thr Asn Leu Thr Lys Thr
 85             90             95
Val Asn Glu Asn Lys Gln Asn Val Asp Ala Lys Val Lys Ala Ala Glu
 100            105            110
Ser Glu Ile Glu Lys Leu Thr Thr Lys Leu Ala Asp Thr Asp Ala Ala
 115            120            125
Leu Ala Asp Thr Asp Ala Ala Leu Asp Ala Thr Thr Asn Ala Leu Asn
 130            135            140
Lys Leu Gly Glu Asn Ile Thr Thr Phe Ala Glu Glu Thr Lys Thr Asn
 145            150            155            160

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Ile	Val	Lys	Ile	Asp	Glu	Lys	Leu	Glu	Ala	Val	Ala	Asp	Thr	Val	Asp	
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Ala	Ala	Asp	Lys	Ala	Glu	Ala	Val	Ala	Ala	Lys	Val	Thr	Asp	Ile	Lys	
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Ala	Asp	Ile	Ala	Thr	Asn	Lys	Asp	Asn	Ile	Ala	Lys	Lys	Ala	Asn	Ser	
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Ala	Asp	Val	Tyr	Thr	Arg	Glu	Glu	Ser	Asp	Ser	Lys	Phe	Val	Arg	Ile	
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Lys	Thr	Val	Ser	Asp	Leu	Arg	Lys	Glu	Thr	Arg	Gln	Gly	Leu	Ala	Glu	
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<211> 327

<212> PRT

<213> N. meningitidis

<400> 2

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Thr	Ile	Tyr	Asp	Ile	Asp	Glu	Asp	Gly	Thr	Ile	Thr	Lys	Lys	Asp	Ala	
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Val	Asp	Ala	Lys	Val	Lys	Ala	Ala	Glu	Ser	Glu	Ile	Glu	Lys	Leu	Thr	
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Thr	Lys	Leu	Ala	Asp	Thr	Asp	Ala	Ala	Leu	Ala	Asp	Thr	Asp	Ala	Ala	
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Leu	Asp	Ala	Thr	Thr	Asn	Ala	Leu	Asn	Lys	Leu	Gly	Glu	Asn	Ile	Thr	
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Thr	Phe	Ala	Glu	Glu	Thr	Lys	Thr	Asn	Ile	Val	Lys	Ile	Asp	Glu	Lys	
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Leu	Glu	Ala	Val	Ala	Asp	Thr	Val	Asp	Lys	His	Ala	Glu	Ala	Phe	Asn	
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Val	Lys	Thr	Ala	Asn	Glu	Ala	Lys	Gln	Thr	Ala	Glu	Glu	Thr	Lys	Gln	
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Asn	Val	Asp	Ala	Lys	Val	Lys	Ala	Ala	Glu	Thr	Ala	Ala	Gly	Lys	Ala	

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Glu Ala Ala Ala Gly Thr Ala Asn Thr Ala Ala Asp Lys Ala Glu Ala		
210	215	220
Val Ala Ala Lys Val Thr Asp Ile Lys Ala Asp Ile Ala Thr Asn Lys		
225	230	235
Asp Asn Ile Ala Lys Lys Ala Asn Ser Ala Asp Val Tyr Thr Arg Glu		
245	250	255
Glu Ser Asp Ser Lys Phe Val Arg Ile Asp Gly Leu Asn Ala Thr Thr		
260	265	270
Glu Lys Leu Asp Thr Arg Leu Ala Ser Ala Glu Lys Ser Ile Ala Asp		
275	280	285
His Asp Thr Arg Leu Asn Gly Leu Asp Lys Thr Val Ser Asp Leu Arg		
290	295	300
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Phe Gln Pro Tyr Asn Val Gly		320
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<210> 3
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 <212> PRT
 <213> N. meningitidis

<400> 3

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Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln Gly Ala Glu Lys	
35 40 45	
Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp	
50 55 60	
Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu Val Asp Gly Gln	
65 70 75 80	
Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr Lys Gln Ser His	
85 90 95	
Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln Asp Ser Glu His	
100 105 110	
Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile Gly Asp Ile Ala	
115 120 125	
Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly Gly Arg Ala Thr	
130 135 140	
Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly Gly Lys Leu Thr	
145 150 155 160	
Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly Lys Ile Glu His	
165 170 175	
Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala Ala Asp Ile Lys	
180 185 190	
Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser Val Leu Tyr Asn	
195 200 205	
Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe Gly Gly Lys Ala	
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His Ile Gly Leu Ala Lys Gln	
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<210> 4
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 <213> N. meningitidis

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 Arg Ile Glu Thr Thr Ala Arg Ser Tyr Leu Arg Gln Asn Asn Gln Thr
 35 40 45
 Lys Gly Tyr Thr Pro Gln Ile Ser Val Val Gly Tyr Asn Arg His Leu
 50 55 60
 Leu Leu Leu Gly Gln Val Ala Thr Glu Gly Glu Lys Gln Phe Val Gly
 65 70 75 80
 Gln Ile Ala Arg Ser Glu Gln Ala Ala Glu Gly Val Tyr Asn Tyr Ile
 85 90 95
 Thr Val Ala Ser Leu Pro Arg Thr Ala Gly Asp Ile Ala Gly Asp Thr
 100 105 110
 Trp Asn Thr Ser Lys Val Arg Ala Thr Leu Leu Gly Ile Ser Pro Ala
 115 120 125
 Thr Gln Ala Arg Val Lys Ile Val Thr Tyr Gly Asn Val Thr Tyr Val
 130 135 140
 Met Gly Ile Leu Thr Pro Glu Glu Gln Ala Gln Ile Thr Gln Lys Val
 145 150 155 160
 Ser Thr Thr Val Gly Val Gln Lys Val Ile Thr Leu Tyr Gln Asn Tyr
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 Val Gln Arg

<210> 5
 <211> 168
 <212> PRT
 <213> N. meningitidis

<400> 5
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 35 40 45
 Thr Ile Pro Ile Ala Asn Leu Gln Ser Gly Ser Gln His Phe Thr Asp
 50 55 60
 His Leu Lys Ser Ala Asp Ile Phe Asp Ala Ala Gln Tyr Pro Asp Ile
 65 70 75 80
 Arg Phe Val Ser Thr Lys Phe Asn Phe Asn Gly Lys Lys Leu Val Ser
 85 90 95
 Val Asp Gly Asn Leu Thr Met His Gly Lys Thr Ala Pro Val Lys Leu
 100 105 110
 Lys Ala Glu Lys Phe Asn Cys Tyr Gln Ser Pro Met Glu Lys Thr Glu
 115 120 125
 Val Cys Gly Gly Asp Phe Ser Thr Thr Ile Asp Arg Thr Lys Trp Gly

130		135		140
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Ile Gln Ile Glu Ala	Lys Gln			
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 <212> PRT
 <213> N. meningitidis

<400> 6																			
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Gly Ser Gln Gly Gln Gly Ala Pro Ser Ala Gln Gly Ser Gln Asp Met																			
	35					40						45							
Ala Ala Val Ser Glu Glu Asn Thr Gly Asn Gly Gly Ala Val Thr Ala																			
	50					55					60								
Asp Asn Pro Lys Asn Glu Asp Glu Val Ala Gln Asn Asp Met Pro Gln																			
65				70				75						80					
Asn Ala Ala Gly Thr Asp Ser Ser Thr Pro Asn His Thr Pro Asp Pro																			
	85						90						95						
Asn Met Leu Ala Gly Asn Met Glu Asn Gln Ala Thr Asp Ala Gly Glu																			
	100					105							110						
Ser Ser Gln Pro Ala Asn Gln Pro Asp Met Ala Asn Ala Ala Asp Gly																			
	115					120						125							
Met Gln Gly Asp Asp Pro Ser Ala Gly Gly Gln Asn Ala Gly Asn Thr																			
	130					135					140								
Ala Ala Gln Gly Ala Asn Gln Ala Gly Asn Asn Gln Ala Ala Gly Ser																			
145				150				155						160					
Ser Asp Pro Ile Pro Ala Ser Asn Pro Ala Pro Ala Asn Gly Gly Ser																			
	165						170							175					
Asn Phe Gly Arg Val Asp Leu Ala Asn Gly Val Leu Ile Asp Gly Pro																			
	180					185							190						
Ser Gln Asn Ile Thr Leu Thr His Cys Lys Gly Asp Ser Cys Ser Gly																			
	195					200							205						
Asn Asn Phe Leu Asp Glu Glu Val Gln Leu Lys Ser Glu Phe Glu Lys																			
	210					215							220						
Leu Ser Asp Ala Asp Lys Ile Ser Asn Tyr Lys Lys Asp Gly Lys Asn																			
225				230				235						240					
Asp Lys Phe Val Gly Leu Val Ala Asp Ser Val Gln Met Lys Gly Ile																			
	245						250							255					
Asn Gln Tyr Ile Ile Phe Tyr Lys Pro Lys Pro Thr Ser Phe Ala Arg																			
	260					265							270						
Phe Arg Arg Ser Ala Arg Ser Arg Arg Ser Leu Pro Ala Glu Met Pro																			
	275					280							285						
Leu Ile Pro Val Asn Gln Ala Asp Thr Leu Ile Val Asp Gly Glu Ala																			
	290					295							300						
Val Ser Leu Thr Gly His Ser Gly Asn Ile Phe Ala Pro Glu Gly Asn																			
305				310				315						320					
Tyr Arg Tyr Leu Thr Tyr Gly Ala Glu Lys Leu Pro Gly Gly Ser Tyr																			
	325						330							335					
Ala Leu Arg Val Gln Gly Glu Pro Ala Lys Gly Glu Met Leu Ala Gly																			
	340					345							350						

Ala	Ala	Val	Tyr	Asn	Gly	Glu	Val	Leu	His	Phe	His	Thr	Glu	Asn	Gly
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Arg	Pro	Tyr	Pro	Thr	Arg	Gly	Arg	Phe	Ala	Ala	Lys	Val	Asp	Phe	Gly
	370					375					380				
Ser	Lys	Ser	Val	Asp	Gly	Ile	Ile	Asp	Ser	Gly	Asp	Asp	Leu	His	Met
385					390					395					400
Gly	Thr	Gln	Lys	Phe	Lys	Ala	Ala	Ile	Asp	Gly	Asn	Gly	Phe	Lys	Gly
				405					410					415	
Thr	Trp	Thr	Glu	Asn	Gly	Ser	Gly	Asp	Val	Ser	Gly	Lys	Phe	Tyr	Gly
			420					425					430		
Pro	Ala	Gly	Glu	Glu	Val	Ala	Gly	Lys	Tyr	Ser	Tyr	Arg	Pro	Thr	Asp
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<210> 7

<211> 644

<212> PRT

<213> N. meningitidis

<400> 7

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Ala	Pro	Val	Val	Ser	Glu	Lys	Glu	Thr	Glu	Ala	Lys	Glu	Asp	Ala	Pro
			20					25					30		
Gln	Ala	Gly	Ser	Gln	Gly	Gln	Gly	Ala	Pro	Ser	Ala	Gln	Gly	Gly	Gln
		35					40					45			
Asp	Met	Ala	Ala	Val	Ser	Glu	Glu	Asn	Thr	Gly	Asn	Gly	Gly	Ala	Ala
	50					55				60					
Ala	Thr	Asp	Lys	Pro	Lys	Asn	Glu	Asp	Glu	Gly	Ala	Gln	Asn	Asp	Met
65					70					75				80	
Pro	Gln	Asn	Ala	Ala	Asp	Thr	Asp	Ser	Leu	Thr	Pro	Asn	His	Thr	Pro
			85					90					95		
Ala	Ser	Asn	Met	Pro	Ala	Gly	Asn	Met	Glu	Asn	Gln	Ala	Pro	Asp	Ala
			100					105					110		
Gly	Glu	Ser	Glu	Gln	Pro	Ala	Asn	Gln	Pro	Asp	Met	Ala	Asn	Thr	Ala
		115					120					125			
Asp	Gly	Met	Gln	Gly	Asp	Asp	Pro	Ser	Ala	Gly	Gly	Glu	Asn	Ala	Gly
	130					135					140				
Asn	Thr	Ala	Ala	Gln	Gly	Thr	Asn	Gln	Ala	Glu	Asn	Asn	Gln	Thr	Ala
145					150					155				160	
Gly	Ser	Gln	Asn	Pro	Ala	Ser	Ser	Thr	Asn	Pro	Ser	Ala	Thr	Asn	Ser
			165						170					175	
Gly	Gly	Asp	Phe	Gly	Arg	Thr	Asn	Val	Gly	Asn	Ser	Val	Val	Ile	Asp
		180						185					190		
Gly	Pro	Ser	Gln	Asn	Ile	Thr	Leu	Thr	His	Cys	Lys	Gly	Asp	Ser	Cys
		195					200					205			
Ser	Gly	Asn	Asn	Phe	Leu	Asp	Glu	Glu	Val	Gln	Leu	Lys	Ser	Glu	Phe
	210					215					220				
Glu	Lys	Leu	Ser	Asp	Ala	Asp	Lys	Ile	Ser	Asn	Tyr	Lys	Lys	Asp	Gly
225					230					235				240	
Lys	Asn	Asp	Gly	Lys	Asn	Asp	Lys	Phe	Val	Gly	Leu	Val	Ala	Asp	Ser
				245					250					255	
Val	Gln	Met	Lys	Gly	Ile	Asn	Gln	Tyr	Ile	Ile	Phe	Tyr	Lys	Pro	Lys
		260						265					270		
Pro	Thr	Ser	Phe	Ala	Arg	Phe	Arg	Arg	Ser	Ala	Arg	Ser	Arg	Arg	Ser

275	280	285
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290	295	300
Ile Val Asp Gly Glu Ala Val Ser Leu Thr Gly His Ser Gly Asn Ile		
305	310	315
Phe Ala Pro Glu Gly Asn Tyr Arg Tyr Leu Thr Tyr Gly Ala Glu Lys		
	325	330
Leu Pro Gly Gly Ser Tyr Ala Leu Arg Val Gln Gly Glu Pro Ser Lys		
	340	345
Gly Glu Met Leu Ala Gly Thr Ala Val Tyr Asn Gly Glu Val Leu His		
	355	360
Phe His Thr Glu Asn Gly Arg Pro Ser Pro Ser Arg Gly Arg Phe Ala		
	370	375
Ala Lys Val Asp Phe Gly Ser Lys Ser Val Asp Gly Ile Ile Asp Ser		
385	390	395
Gly Asp Gly Leu His Met Gly Thr Gln Lys Phe Lys Ala Ala Ile Asp		
	405	410
Gly Asn Gly Phe Lys Gly Thr Trp Thr Glu Asn Gly Gly Gly Asp Val		
	420	425
Ser Gly Lys Phe Tyr Gly Pro Ala Gly Glu Glu Val Ala Gly Lys Tyr		
	435	440
Ser Tyr Arg Pro Thr Asp Ala Glu Lys Gly Gly Phe Gly Val Phe Ala		
	450	455
Gly Lys Lys Glu Gln Asp Gly Ser Gly Gly Gly Gly Ala Thr Tyr Lys		
465	470	475
Val Asp Glu Tyr His Ala Asn Ala Arg Phe Ala Ile Asp His Phe Asn		
	485	490
Thr Ser Thr Asn Val Gly Gly Phe Tyr Gly Leu Thr Gly Ser Val Glu		
	500	505
Phe Asp Gln Ala Lys Arg Asp Gly Lys Ile Asp Ile Thr Ile Pro Val		
	515	520
Ala Asn Leu Gln Ser Gly Ser Gln His Phe Thr Asp His Leu Lys Ser		
	530	535
Ala Asp Ile Phe Asp Ala Ala Gln Tyr Pro Asp Ile Arg Phe Val Ser		
545	550	555
Thr Lys Phe Asn Phe Asn Gly Lys Lys Leu Val Ser Val Asp Gly Asn		
	565	570
Leu Thr Met His Gly Lys Thr Ala Pro Val Lys Leu Lys Ala Glu Lys		
	580	585
Phe Asn Cys Tyr Gln Ser Pro Met Ala Lys Thr Glu Val Cys Gly Gly		
	595	600
Asp Phe Ser Thr Thr Ile Asp Arg Thr Lys Trp Gly Val Asp Tyr Leu		
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Val Asn Val Gly Met Thr Lys Ser Val Arg Ile Asp Ile Gln Ile Glu		
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Ala Ala Lys Gln		640

<210> 8

<211> 434

<212> PRT

<213> N. meningitidis

<400> 8

Met Val Ser Ala Val Ile Gly Ser Ala Ala Val Gly Ala Lys Ser Ala
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Leu	Arg	Ile	Glu	Thr	Thr	Ala	Arg	Ser	Tyr	Leu	Arg	Gln	Asn	Asn	Gln	
		35					40					45				
Thr	Lys	Gly	Tyr	Thr	Pro	Gln	Ile	Ser	Val	Val	Gly	Tyr	Asn	Arg	His	
	50					55					60					
Leu	Leu	Leu	Leu	Gly	Gln	Val	Ala	Thr	Glu	Gly	Glu	Lys	Gln	Phe	Val	
65					70					75					80	
Gly	Gln	Ile	Ala	Arg	Ser	Glu	Gln	Ala	Ala	Glu	Gly	Val	Tyr	Asn	Tyr	
				85					90					95		
Ile	Thr	Val	Ala	Ser	Leu	Pro	Arg	Thr	Ala	Gly	Asp	Ile	Ala	Gly	Asp	
			100					105					110			
Thr	Trp	Asn	Thr	Ser	Lys	Val	Arg	Ala	Thr	Leu	Leu	Gly	Ile	Ser	Pro	
		115					120					125				
Ala	Thr	Gln	Ala	Arg	Val	Lys	Ile	Val	Thr	Tyr	Gly	Asn	Val	Thr	Tyr	
	130					135					140					
Val	Met	Gly	Ile	Leu	Thr	Pro	Glu	Glu	Gln	Ala	Gln	Ile	Thr	Gln	Lys	
145					150					155					160	
Val	Ser	Thr	Thr	Val	Gly	Val	Gln	Lys	Val	Ile	Thr	Leu	Tyr	Gln	Asn	
				165					170					175		
Tyr	Val	Gln	Arg	Gly	Ser	Gly	Gly	Gly	Gly	Val	Ala	Ala	Asp	Ile	Gly	
			180				185						190			
Ala	Gly	Leu	Ala	Asp	Ala	Leu	Thr	Ala	Pro	Leu	Asp	His	Lys	Asp	Lys	
	195					200						205				
Gly	Leu	Gln	Ser	Leu	Thr	Leu	Asp	Gln	Ser	Val	Arg	Lys	Asn	Glu	Lys	
	210					215					220					
Leu	Lys	Leu	Ala	Ala	Gln	Gly	Ala	Glu	Lys	Thr	Tyr	Gly	Asn	Gly	Asp	
225					230					235					240	
Ser	Leu	Asn	Thr	Gly	Lys	Leu	Lys	Asn	Asp	Lys	Val	Ser	Arg	Phe	Asp	
				245					250					255		
Phe	Ile	Arg	Gln	Ile	Glu	Val	Asp	Gly	Gln	Leu	Ile	Thr	Leu	Glu	Ser	
			260					265					270			
Gly	Glu	Phe	Gln	Val	Tyr	Lys	Gln	Ser	His	Ser	Ala	Leu	Thr	Ala	Phe	
		275					280					285				
Gln	Thr	Glu	Gln	Ile	Gln	Asp	Ser	Glu	His	Ser	Gly	Lys	Met	Val	Ala	
	290					295					300					
Lys	Arg	Gln	Phe	Arg	Ile	Gly	Asp	Ile	Ala	Gly	Glu	His	Thr	Ser	Phe	
305					310					315					320	
Asp	Lys	Leu	Pro	Glu	Gly	Gly	Arg	Ala	Thr	Tyr	Arg	Gly	Thr	Ala	Phe	
				325					330					335		
Gly	Ser	Asp	Asp	Ala	Gly	Gly	Lys	Leu	Thr	Tyr	Thr	Ile	Asp	Phe	Ala	
		340					345						350			
Ala	Lys	Gln	Gly	Asn	Gly	Lys	Ile	Glu	His	Leu	Lys	Ser	Pro	Glu	Leu	
		355					360					365				
Asn	Val	Asp	Leu	Ala	Ala	Ala	Asp	Ile	Lys	Pro	Asp	Gly	Lys	Arg	His	
	370					375					380					
Ala	Val	Ile	Ser	Gly	Ser	Val	Leu	Tyr	Asn	Gln	Ala	Glu	Lys	Gly	Ser	
385					390					395					400	
Tyr	Ser	Leu	Gly	Ile	Phe	Gly	Gly	Lys	Ala	Gln	Glu	Val	Ala	Gly	Ser	
				405					410					415		
Ala	Glu	Val	Lys	Thr	Val	Asn	Gly	Ile	Arg	His	Ile	Gly	Leu	Ala	Ala	
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Lys	Gln															

<211> 6
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 <213> Unknown

<220>
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<400> 9
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 1 5

<210> 10
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 <213> N. meningitidis

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 Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
 35 40 45
 Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
 50 55 60
 Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
 65 70 75 80
 Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
 85 90 95
 Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
 100 105 110
 Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
 115 120 125
 Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
 130 135 140
 Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
 145 150 155 160
 Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
 165 170 175
 Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
 180 185 190
 Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
 195 200 205
 Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
 210 215 220
 Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
 225 230 235 240
 Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
 245 250 255

<210> 11
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 <212> PRT
 <213> N. meningitidis

<400> 11

Cys	Ser	Ser	Gly	Gly	Gly	Gly	Val	Ala	Ala	Asp	Ile	Gly	Ala	Gly	Leu
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			20					25					30		
Ser	Leu	Thr	Leu	Asp	Gln	Ser	Val	Arg	Lys	Asn	Glu	Lys	Leu	Lys	Leu
		35					40					45			
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Thr	Gly	Lys	Leu	Lys	Asn	Asp	Lys	Val	Ser	Arg	Phe	Asp	Phe	Ile	Arg
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Gln	Ile	Glu	Val	Asp	Gly	Gln	Leu	Ile	Thr	Leu	Glu	Ser	Gly	Glu	Phe
				85					90					95	
Gln	Ile	Tyr	Lys	Gln	Asp	His	Ser	Ala	Val	Val	Ala	Leu	Gln	Ile	Glu
			100					105					110		
Lys	Ile	Asn	Asn	Pro	Asp	Lys	Ile	Asp	Ser	Leu	Ile	Asn	Gln	Arg	Ser
		115					120					125			
Phe	Leu	Val	Ser	Gly	Leu	Gly	Gly	Glu	His	Thr	Ala	Phe	Asn	Gln	Leu
	130					135					140				
Pro	Asp	Gly	Lys	Ala	Glu	Tyr	His	Gly	Lys	Ala	Phe	Ser	Ser	Asp	Asp
145					150					155					160
Ala	Gly	Gly	Lys	Leu	Thr	Tyr	Thr	Ile	Asp	Phe	Ala	Ala	Lys	Gln	Gly
				165					170					175	
His	Gly	Lys	Ile	Glu	His	Leu	Lys	Thr	Pro	Glu	Gln	Asn	Val	Glu	Leu
			180					185					190		
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		195					200					205			
Gly	Asp	Thr	Arg	Tyr	Gly	Ser	Glu	Glu	Lys	Gly	Thr	Tyr	His	Leu	Ala
	210					215					220				
Leu	Phe	Gly	Asp	Arg	Ala	Gln	Glu	Ile	Ala	Gly	Ser	Ala	Thr	Val	Lys
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<211> 262

<212> PRT

<213> N. meningitidis

<400> 12

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			20					25					30		
Asp	Lys	Gly	Leu	Lys	Ser	Leu	Thr	Leu	Glu	Asp	Ser	Ile	Pro	Gln	Asn
		35					40					45			
Gly	Thr	Leu	Thr	Leu	Ser	Ala	Gln	Gly	Ala	Glu	Lys	Thr	Phe	Lys	Ala
	50					55					60				
Gly	Asp	Lys	Asp	Asn	Ser	Leu	Asn	Thr	Gly	Lys	Leu	Lys	Asn	Asp	Lys
65					70					75					80
Ile	Ser	Arg	Phe	Asp	Phe	Val	Gln	Lys	Ile	Glu	Val	Asp	Gly	Gln	Thr
			85						90					95	
Ile	Thr	Leu	Ala	Ser	Gly	Glu	Phe	Gln	Ile	Tyr	Lys	Gln	Asn	His	Ser
			100					105					110		
Ala	Val	Val	Ala	Leu	Gln	Ile	Glu	Lys	Ile	Asn	Asn	Pro	Asp	Lys	Thr
		115						120					125		

Asp	Ser	Leu	Ile	Asn	Gln	Arg	Ser	Phe	Leu	Val	Ser	Gly	Leu	Gly	Gly
130						135					140				
Glu	His	Thr	Ala	Phe	Asn	Gln	Leu	Pro	Gly	Gly	Lys	Ala	Glu	Tyr	His
145					150					155					160
Gly	Lys	Ala	Phe	Ser	Ser	Asp	Asp	Pro	Asn	Gly	Arg	Leu	His	Tyr	Ser
				165					170					175	
Ile	Asp	Phe	Thr	Lys	Lys	Gln	Gly	Tyr	Gly	Arg	Ile	Glu	His	Leu	Lys
			180				185						190		
Thr	Leu	Glu	Gln	Asn	Val	Glu	Leu	Ala	Ala	Ala	Glu	Leu	Lys	Ala	Asp
	195					200					205				
Glu	Lys	Ser	His	Ala	Val	Ile	Leu	Gly	Asp	Thr	Arg	Tyr	Gly	Ser	Glu
210						215					220				
Glu	Lys	Gly	Thr	Tyr	His	Leu	Ala	Leu	Phe	Gly	Asp	Arg	Ala	Gln	Glu
225					230				235					240	
Ile	Ala	Gly	Ser	Ala	Thr	Val	Lys	Ile	Gly	Glu	Lys	Val	His	Glu	Ile
				245				250						255	
Gly	Ile	Ala	Gly	Lys	Gln										
			260												